Nov. 13, 1951 A. J. GETZ ET AL 2,574,473

TRAVELING SHOP HOIST

Filed Oct. 11, 1948 2 SHEETS—SHEET 1

Fig. 1.

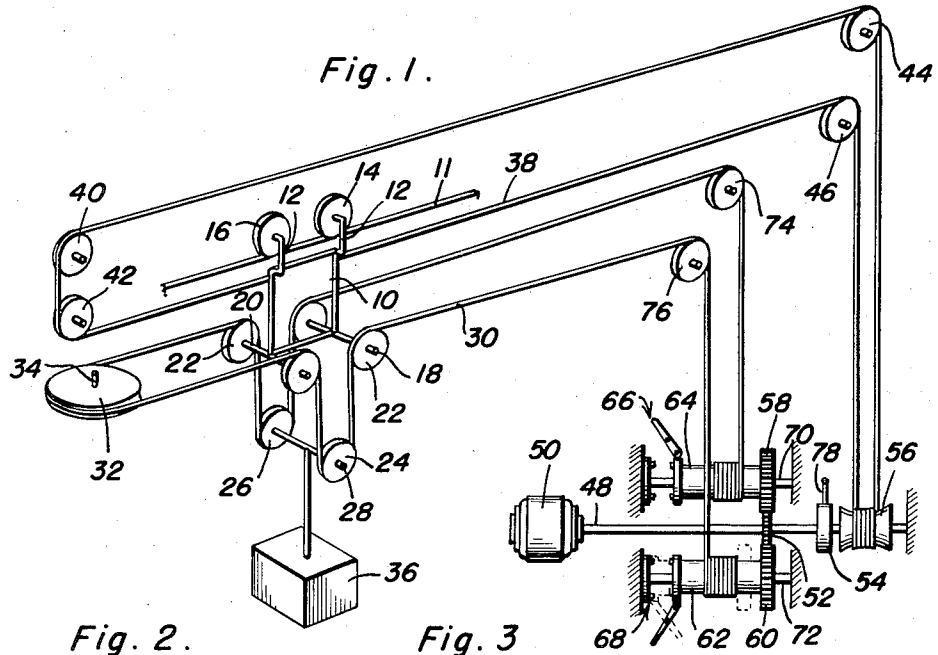


Fig. 2.

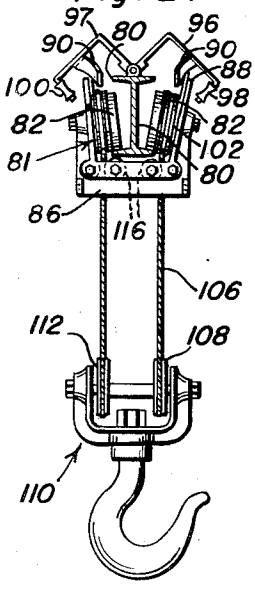


Fig. 3

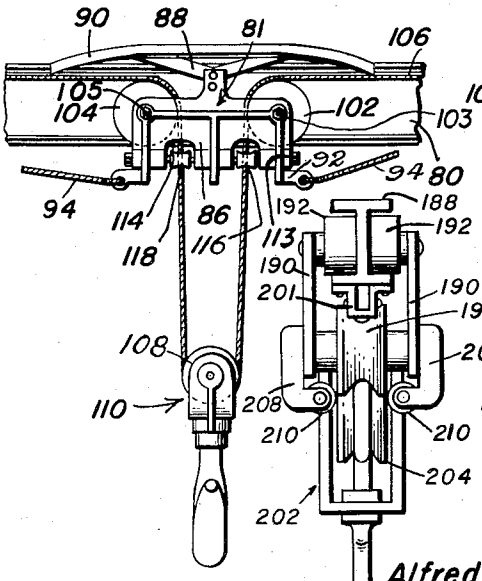


Fig. 4.

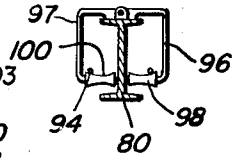


FIG. 9.

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Fig. 5.

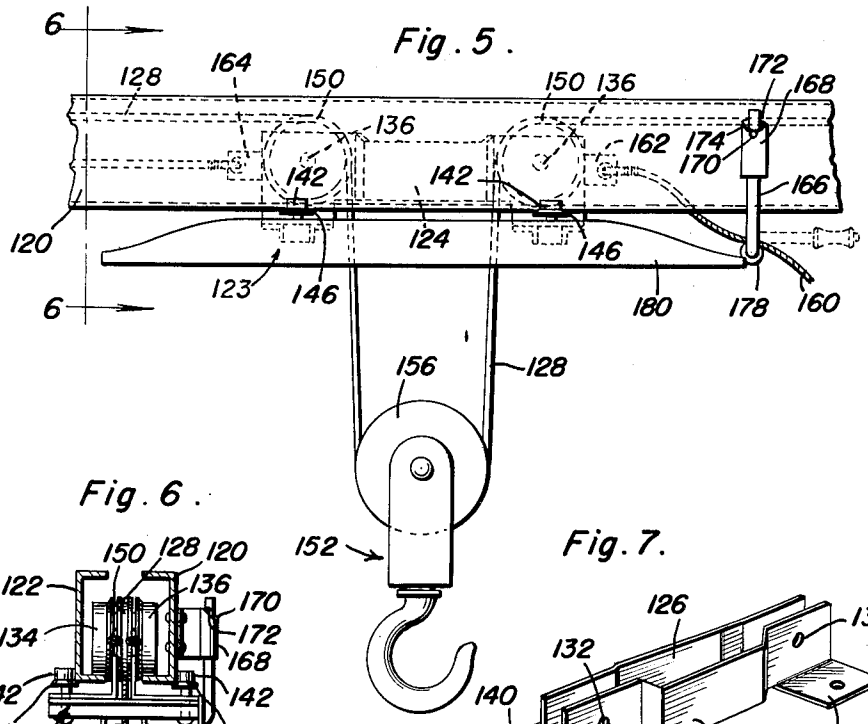


Fig. 6.

Fig. 7.

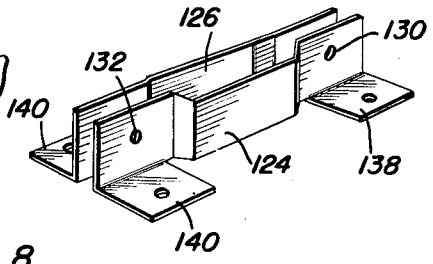
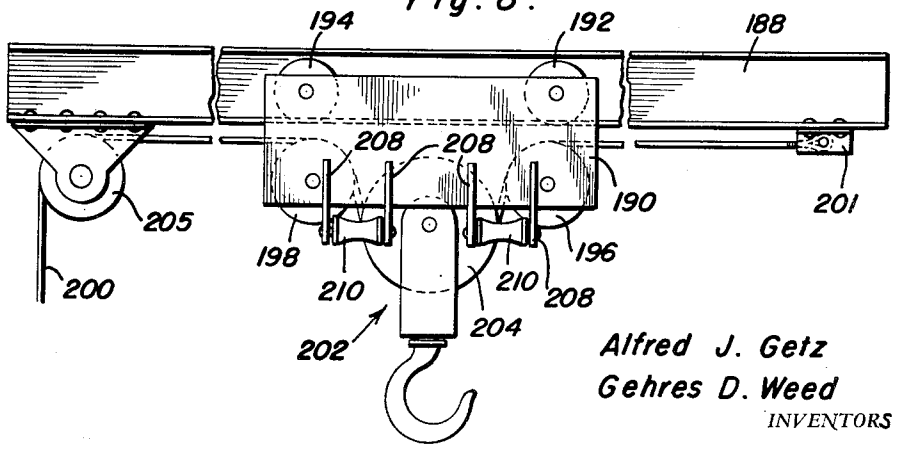


Fig. 8.



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Patented Nov. 13, 1951 2,574,473

UNITED STATES PATENT OFFICE

2,574,473

TRAVELING SHOP HOIST

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Application October 11, 1948, Serial No. 53,882

3 Claims. (Cl. 212—94)

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This invention relates to novel and useful improvements in traveling shop hoists.

An object of this invention is to support a carriage on an overhead rail or rails, to incorporate within the carriage a cam for actuating a bracket to move the same from the path of travel of the carriage, the bracket supporting the carriage pull rope or cable.

Another object of the invention is to minimize necessary overhead clearance for operation, which is accomplished with no bulky power unit on the carriage and with the nesting of pulleys adjacent each other.

Another object of this invention is to incorporate latch means with the bracket, the latch means being operated by the said cam.

Another purpose of this invention is to utilize one or more rollers which are carried by the carriage and which serve the function of preventing contact of the cable directly with the carriage when the traveling sheave is being raised or lowered and it is not positioned directly beneath the said carriage.

Another object of this invention is to utilize a common source of power such as a motor for imparting rotative movement to a number of drums, one of the drums winding the pull rope thereby rollingly actuating the carriage and at least one of the other drums winding a rope or cable in order to raise or lower the traveling sheave.

Another object of this invention is to provide a practical device of the nature to be described which incorporates various improvements as to rope and cable guiding and handling.

Ancillary objects and features of novelty will become apparent to those skilled in the art, in following the description of the preferred forms of the invention, illustrated in the accompanying drawings, wherein;

Figure 1 is a schematic perspective view of one form of the invention, portions being shown in elevation illustrating the power means;

Figure 2 is a sectional view of an overhead rail having one form of the invention mounted thereon, showing pull ropes supporting brackets in their raised position;

Figure 3 is the side view of the device shown in Figure 2;

Figure 4 is a sectional view of an overhead rail having pull ropes supporting brackets mounted thereon;

Figure 5 is an elevational side view of another form of the invention;

Figure 6 is a sectional view of the overhead rail, which in this instance is a pair of channels, and showing the device in elevation, the view taken substantially on the line 6—6 of Figure 5 and in the direction of the arrows;

Figure 7 is a perspective view of the carriage plates utilized in the carriage of the species of the invention shown in Figures 5 and 6;

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Figure 8 is a side view of another form of the invention; and

Figure 9 is an end view of the structure in Figure 8.

Referring to Figure 1 there is schematically illustrated a carriage plate 10 adapted to be rollingly mounted on a suitable overhead rail 11. Brackets 12 support wheels or rollers 14 and 16 respectively to serve this purpose.

At the lower portion of the schematically shown carriage plate 10 there is a pair of axles 18 and 20 respectively which support pulleys 22 at each end of each axle. A pair of traveling sheaves 24 and 26 respectively are mounted on a shaft 28 and a conventional rope or cable or other suitable flexible elongated member 30 extends thereunder. This rope or cable also is guided by the pulleys 22 and extends around an idler pulley 32. This idler pulley is suitably mounted by means of a small shaft or pin 34.

It is apparent that when the elongated flexible element is played in, the mass or weight 36 supported by the shaft 28 will be raised. Of course, playing out the elongated flexible member 30 will lower the weight or mass 36.

Attached to opposite sides of the carriage plate 10 is a pull rope 38 which is entrained around a pair of idlers 42 and 40 respectively, thence around two more idlers 44 and 46 respectively. Playing in one portion of the rope 38 while allowing the other portion to play out or slacken will move the entire carriage with all its pertinent structure.

Means for performing various operations on the ropes or cables 30 and 38 is provided. This particular means may be adapted for use in many modifications of the invention. It will be noted at this point that the rope winding and unwinding means may be attached to a wall of a shop or the like, may be supported vertically, horizontally or located in any convenient spot or position.

A main shaft 48 is driven by a suitable prime mover such as the motor 50. This main shaft has a pinion 52 intermediate its length, a clutch indicated at 54 (conventional per se) and a drum 56. The said drum 56 has the pull rope or cable 38 partially wound therearound, whereby torque developed by the motor may play in or play out the rope 38 to roll the carriage to the preselected or desired positions.

The pinion 52 is meshed with gears 58 and 60 respectively in order to impart torque from the shaft 48 to the drums 62 and 64 respectively. An end of the rope 30 is secured to the drum 62, while the other end is attached to the drum 64. It is apparent that through the gearing the drums rotate in opposite directions thereby pulling in the cable or rope or other suitable flexible elongated element 30 in order to raise and lower the weight 36 ultimately.

On occasion it may be desirable to disengage

one or the other of the said drums 62 and 64 respectively. This is accomplished through the medium of the conventional locking clutch mechanisms seen at 66 and 68 respectively. The drums 62 and 64 are slid on the supporting shafts 70 and 72 respectively by this actuation means. Then, either one or the other or neither of the drums 62 and 64 may be operated upon. In order to guide the flexible element 30 a pair of idler pulleys 74 and 76 respectively may be suitably attached by means of pins through any relatively stationary element.

The said clutch mechanism 54 may have a transmission with a reverse gear, whereby manipulation of the handle 78 transfers the movement of the shaft 48 to movement of the drum 56 in the opposite direction.

Referring now to Figures 2–4 an I beam is utilized for the overhead beam or rail 80. A carriage 81 is supported on the lower flanges of the I beam 80 by means of four rollers, each of which is indicated at 82. A carriage plate 86 supports the said rollers 82 and may be substantially U-shaped in appearance.

A bracket 88 is attached to pairs of legs of the U-shaped carriage plate in order to accommodate a cam 90. There are two brackets 88 supplied and two cams 90, one pair of legs and one cam being on each side of the rail.

A number of ears 92 are attached to the said carriage plate in order to accommodate the ends of a pull rope 94. This pull rope objectionably sags in certain instances and means is provided specifically for the purpose of preventing this sagging. For this structure attention is directed to Figure 4 wherein is disclosed a pair of identical brackets 96 and 97 hingedly or pivotally mounted to the top of the I beam 80. At the lower portion of the brackets there are rollers 98 and 100 respectively forming a seat for the pull rope or cable 94.

A plurality of the bracket assemblies are provided on the I beam 80 at spaced positions. The said brackets 96 and 97 would interfere with the movement of the carriage unless some means were supplied for pivotally actuating the brackets. The cam 90 is used for this purpose. Upon engagement of the cams 90 with the brackets, they are lifted thereby allowing the carriage to move past them on the I beam.

Pulleys 102 and 104 are provided on each side of the carriage being supported by means of stub shafts 103 and 105, which also support rollers 82. A cable or rope is entrained over the pulleys 102 and 104 and also around a sheave 108 which is formed as a portion of a conventional hook mechanism generally indicated at 110. The said rope or cable 106 extends the full length of the I beam, whereupon it may be anchored or returned about an idler similar to that shown at 32. Then, it is entrained around a second sheave 112 of the hook mechanism 110 and around the opposite pair of pulleys on the carriage 81.

On each side of the carriage 81 a pin 113 is supplied. Recesses 114 are formed in the said carriage plate 86 and the pin extends through the said recesses. There are two pins supplied and two recesses for each pin.

Rollers 116 and 118 respectively are rotatably mounted on the pins 113 and are disposed within the recesses 114. The function of these rollers is to prevent the cable or rope 106 from jumping the pulleys 104 and 102 when lateral pulling with relation to the vertical is attributed to the hook mechanism 110. It is often desirable to lift a device which is not directly beneath the carriage and this occasionally results in the cable or rope jamming or jumping the pulleys. Through the use of the rollers 116 and 118 this difficulty has been obviated.

Referring now to Figures 5–7 it is seen that the overhead rail is formed of a pair of slightly spaced channels 120, 122 respectively with their flanges in confronting relation. A carriage which includes carriage plates 124 and 126 respectively is supplied in association with the overhead rail formed by both channels. Each carriage plate is supplied with end portions which are noncoplanar with the central portions thereof and the noncoplanar portions are formed with apertures 130 and 132 respectively. Rollers 134 and 136 provided at each end of the carriage plates 124 and 126 are adapted to engage and roll on the lower flange of each channel forming the rail. By this means the carriage is rollingly supported on the overhead rail.

Flanges 138 and 140 respectively which are substantially perpendicular to the noncoplanar portions of the carriage plates extend beneath the lower flanges of the channels 120 and 122 respectively. Suitable pins or shafts extend through the apertures in the flanges 138 and 140 in order to accommodate rollers 142 slidably engaging the webs of each channel 120 and 122 respectively. As seen clearly in Figures 6 and 5 respectively the rollers have angularly inclined skirts 146 integral therewith rollingly engageable with the under surface of the rail to prevent lateral and vertical movement of the carriage 123 with respect to the overhead rail.

Mounted on the same shafts which support the rollers 134 and 136 are pulleys 150 having the elongated flexible member or cable or rope 128 and entrained therearound. Alternatives are provided in this structure as to the cable 128. It may be in an arrangement as seen in Figure 1 or, if desired may be anchored at one end and simply pulled from the other in order to raise and lower the hook mechanism indicated generally at 152. This hook mechanism has incorporated therewith a sheave 156, which has the cable 128 entrained therearound, as is conventional in certain types of hook mechanisms.

A pull rope or cable 160 is secured to the carrier by means of small brackets 162 and 164 at the front and rear of the carriage. The same difficulty arises in this embodiment of the invention as in the others. This difficulty resides in the disposition of the pull cable as the carriage is slid along the overhead rail. For that reason one leg of a substantially L-shaped bracket 166 is mounted for reciprocation in a boss 168 which in turn is attached to the outer surface of the web of one of the channels. A pin 170 is attached to the said leg of substantially L-shaped bracket 166 and is adapted to seat in a recess (unnumbered) formed in the top of the boss 168. A cam track or surface 174 is supplied at the upper surface of the said boss 168 for sliding contact with a transverse pin 172. This pin is secured to the bracket 166 in a suitable manner.

A roller 178 is disposed on the other leg of the bracket 166, extending beneath the overhead rail. It is quite apparent from inspection of Figure 5 that upon movement of the carriage in the rail, the cam 180 which is fixed to the carriage 123 will engage the bracket 166, lifting the same and urging the same rotatively with the cam surface 174 being acted upon by the pin 172. This moves the bracket from the direct line of movement of

the carriage. When the bracket is not being moved by the cam 180, the roller 178 supports the pull rope or cable 160. Any number of brackets 166 and pertinent structure may be supplied along the length of the overhead rail in this instance, as found necessary. It is seen that the actuation of this mechanism is responsive to the cam action rendered operative upon positioning the cam 180 beneath the said bracket 166. The travel of the carriage 123 is responsible for such actuation.

Attention is now directed to Figure 8 wherein the final embodiment of the invention is illustrated. It is noted at this point that a 2 to 1 ratio for raising and lowering the hook mechanism 202 is illustrated. However, it is within the purview of the invention to use other ratios such as the 4 to 1 either as seen in Figure 1 or in the conventional manner.

In this instance an I beam 188 is disclosed as an overhead rail. A carriage plate 190 is illustrated with rollers 192 and 194 respectively mounted at the top portion thereof for rolling contact with the lower flange of the I beam 188. Pulleys 196 and 198 are disposed beneath the rollers 192 and 194 and have the elongated flexible elements such as a rope or cable 200 entrained therearound. A bracket 201 is secured to the overhead beam 188 by any suitable means such as riveting or the like and serves the purpose of an anchor for the cable 200. Thus, the cable being anchored at one end to the bracket 201 extends around the pulley 196, around the sheave 204 of the hook mechanism, around the pulley 198 and then around an idler 205 which is mounted on the under surface of the overhead beam. Winding and unwinding force may be applied to the cable 200. Obviously, this raises and lowers the hook mechanism 202 as desired.

For prevention of the cable 200 from becoming disengaged from the pulleys 196 and 198 respectively, a number of depending brackets or hangers 208 are suitably attached to the carriage plate 190. These brackets support rollers 210 engaged by the cable 200 when the hook mechanism is in use and particularly when a lateral thrust is applied to the hook mechanism in raising and lowering a load.

With further relation to the embodiment of the invention shown in Figure 8, it is appreciated that the structure shown in Figure 8 may be duplicated insofar as the carriage plate and pulleys as well as rollers are concerned. The brackets 208 and rollers 210 may also be duplicated and this form of the invention may be propelled along the beam 188 either manually or by means of the previously described structure in conjunction with Figure 1.

It is apparent that certain variations may be made without departing from the spirit of the invention.

Having described the invention, what is claimed as new is:

1. A traveling shop hoist including an overhead rail, a carriage, means forming a portion of said carriage mounted on said overhead rail supporting said carriage, pair of spaced pulleys carried by said carriage, a traveling sheave, a flexible elongated member guided by said pulleys supporting said sheave, said carriage including a carriage plate, rollers carried by said plate and engaging said rail to guide said carriage, a pull rope secured to said carriage, a bracket secured for swinging movement to said rail and supporting said pull rope, means secured to said carriage to engage and move said bracket when said carriage is moved on said rail, and a latch operatively connected with said bracket releasably retaining said bracket in the path of travel of said carriage.

2. A traveling shop hoist including an overhead rail, a carriage with a pull rope secured thereto, means movably secured to said rail for supporting said pull rope, said means consisting of an L-shaped bracket having two connected legs, one of said legs having a rope supporting surface thereon, a bearing attached to said rail and arranged with a bore therein, said bore having its longitudinal axis perpendicular to the path of movement of said carriage, and the other leg of said L-shaped bracket being mounted for rotation in said bore, means forming a portion of said carriage mounted on said overhead rail supporting said carriage for longitudinal movement on said rail, a pair of spaced pulleys carried by said carriage, a flexible elongated member disposed on and guided by said pulleys to raise and lower a load, and a cam secured to said carriage and engaging a portion of said L-shaped bracket to rotate said bracket in said bearing during the travel of said carriage, to thereby move said bracket from the path of travel of said carriage.

3. A traveling shop hoist including an overhead rail, a carriage with a pull rope secured thereto, means movably secured to said rail for supporting said pull rope, said means consisting of an L-shaped bracket having two connected legs, one of said legs having a rope supporting surface thereon, a bearing attached to said rail and arranged with a bore therein, said bore having its longitudinal axis perpendicular to the path of movement of said carriage, and the other leg of said L-shaped bracket being mounted for rotation in said bore, means forming a portion of said carriage mounted on said overhead rail supporting said carriage for longitudinal movement on said rail, a pair of spaced pulleys carried by said carriage, a flexible elongated member disposed on and guided by said pulleys to raise and lower a load, a cam secured to said carriage and engaging a portion of said L-shaped bracket to rotate said bracket in said bearing during the travel of said carriage, to thereby move said bracket from the path of travel of said carriage, and means forming a latch operatively connected with one leg of said bracket and said bearing to releasably hold said bracket so that a portion thereof is in the path of travel of said carriage, and said latch being arranged to be released by said cam.

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